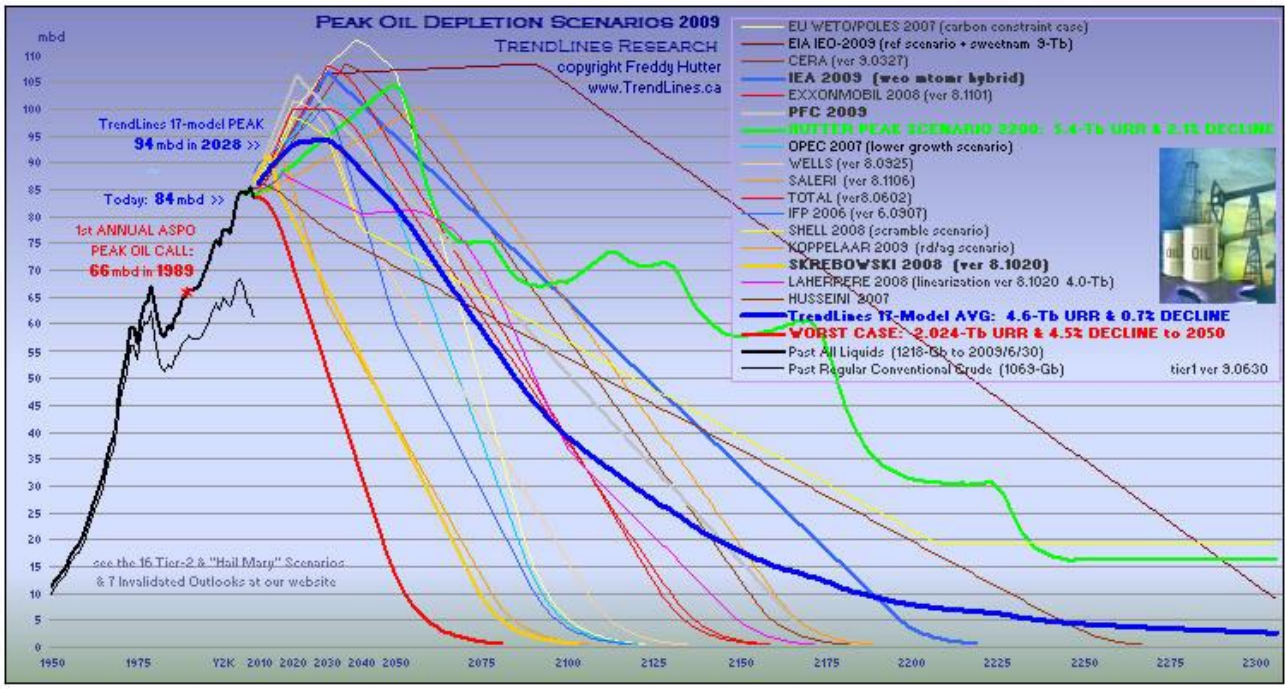
FPC FUSION POWER CORPORATION

The Future - 2050

"The nation that harnesses the power of clean, renewable energy will be the nation that leads the 21st century" … President Obama, 2010

By 2050 fusion will be the source of most of the worlds energy. This is not wishful thinking, it is simply a way of stating that all other forms of energy that are based on the use of finite fossil fuel sources must decline in the next few decades. This decline will provide a major impetus for the rapid increase in the utilization of this new form of energy.



From Simmons & Co Powerpoint on Oil Depletion

Possible Competition from other Fusion Systems

At the present time there is **no other fusion system known to be nearing the stage of potential commercialization.**

Magnetic confinement fusion has been 50 years away for he past 50 years

and is still 50 years away for its commercial application depends upon the creation of a 'magic material' that will shield it from the 14 MeV neutrons. Without this 'magic material' it cannot proceed to commercialization. Lithium in either liquid or solid form cannot be used except as a blanket on the walls and this inherently destroys the vacuum necessary for the reaction.

Other forms of Inertial Coupled Fusion are known to exist. These include **Laser driven fusion** of the sort being studied at the National Ignition Facility (NIF). Put simply, lasers just do not have the power or reliability to sustain Laser driven fusion as a commercial power source. Conversion of the pure Laser fusion to a Laser induced burn of actinide fuels (the LIFE program of LLNL) is thought to be at least 12 years away and has all the problems of laser driven fusion plus the generation of long-half life radioactive byproducts. Thus in our view, it is the worst of both worlds.

Another form of Inertial Coupled Fusion is the **Z-pinch** machine currently being studied by Sandia National Laboratories. The Z-pinch concept has been around for more than a decade and has yet to reach the temperatures necessary for fusion. As new peaks in temperature are reached, new problems are found. This is still a research program and a long way from a practical power plant.

Finally, there are the multitude of room temperature fusion efforts from **cold fusion to electrostatic fusion**. These are interesting science in some cases, and the electrostatic compression mechanisms do yield fusion-produced products, including some isotopes that are very useful in medical applications. But it is unlikely that the techniques will produce large quantities of power for they simply do not have a mechanism that would protect them from the neutrons that would be produced.

As for our version of **Inertial Confined Fusion - *Heavy Ion Fusion*** - we have existing accelerators with adequate energy to call upon for drivers, we have a known and proven method of shielding that uses the high flux of 14 MeV neutrons to make heat and Tritium (a product we consume), and we have a proven means of supplying the compression and heating that is required for

fusion. In fact, we can probably deliver 3 to 10 times enough energy to ignite the fusion reaction if necessary. Moreover, all of our effort is directed at producing practical heat that can be used to produce electricity, hydrogen (and thence liquid fuel), metals, and water – all items that are needed by society today.

Market Analysis

The **global market** for energy is very dependent on the state of the global economic health. The question of which is the chicken and which is the egg consumes endless hours of debate. Suffice it to say that modern society needs abundant energy at a reasonable price to retain its current range of standards of living. The often stated goal of bringing all societies closer to the standard of living of the United States will require substantially more energy than is now produced. Thus there is a latent market throughout the world for more energy than is now available or consumed.

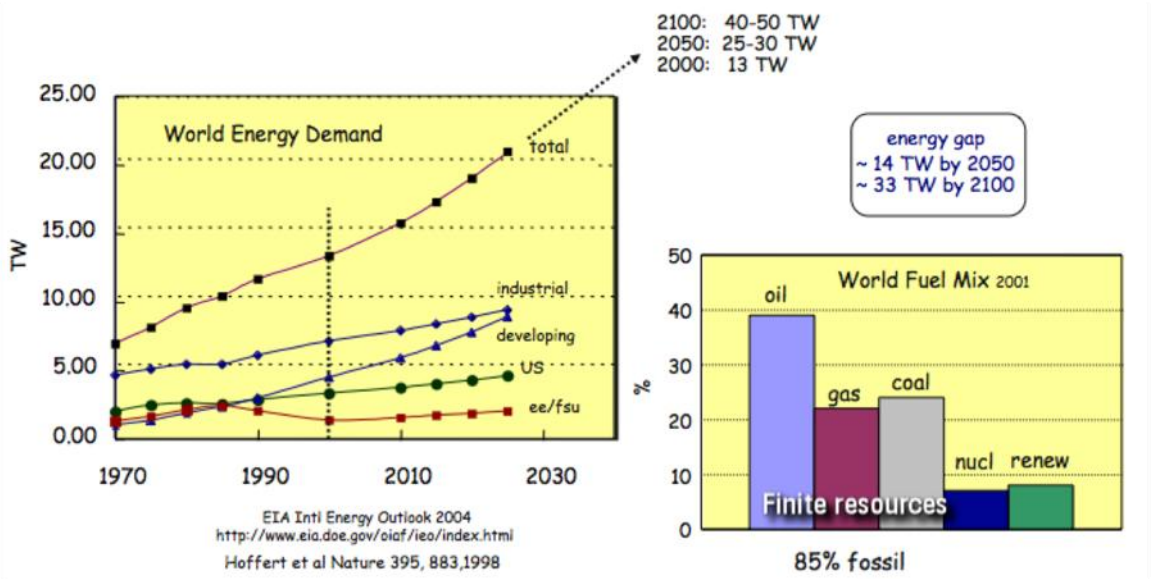
The **energy of the future** must be much more green than the current mix of energy derived from fossil fuels (coal, oil, and gas) and a greater supply level than renewables such as wind, solar, bio fuels and hydropower can provide. Moreover, all of our fossil fuels are finite resources and all must peak. Clearly the future must depend on Fusion and the timing is such that it is needed in the next 10 years. For Fusion to be on line in ten years we must start now.

Fusion energy is the only form of energy that can meet the long-term goal of discharging virtually no unwanted byproduct while concurrently delivering energy at a cost comparable to old oil – i.e. at an energy cost of a few percent of the energy produced.

Philosophy aside, the **need for new energy**, projected by the Energy Information Agency (EIA), is for a growth of about 2 percent per year for the rest of this century. To this one must add the energy production facilities that must be built to replace the loss of energy production by existing sources either due to age of the production facility or due its declining profitability due to the increasing price of its fuel. The current concern for the reduction of emitted CO_2 will also provide an increased demand for CO_2 free power

sources. Thus the growth in demand for power from fusion power plants could be as high as 6 percent per annum just to maintain production at the current level of global demand for energy.

World Energy Demand



A Mind Boggling thought … do the math …

14 TW, the projected additional energy needed by 2050 is about --

…. **10,000** new 1.4GW nuclear fission plants or

…. **18,667** new 750MW coal or gas fired plants or

…. **400** 35GW HIF StarPower Complexes

Every year, for the next 40 years, the need is:

300 new 1.4GW fission power plants, *or*
556 new 750 MW coal or gas powered plants, *or*
12 new 35 GW StarPower fusion complexes) *or*
combination there of!

But to bring all peoples of the world the **benefits** of an abundant energy supply, the growth will have to be more like 10 percent per year. This growth

in energy supply for the underdeveloped world will become a concern or all governments for the alleviation of poverty, and the seeds of terrorism that it plants, can only come through the supplying adequate energy and water to under served populations. Thus FPC believes that fusion power is a necessary growth industry for many decades to come.

The **energy production** business is generally as stable as they come, and generally enjoys increasing revenues yearly. Most of the variability in returns to energy producers comes from variation in the supply of the fuel. Fusion energy has the opportunity to not only supply a needed commodity but to also stabilize the price of energy for it is not subject to variations in fuel supply cost.

Growth in the demand for energy is likely to continue. This is simply because the world population is increasing and everyone wants to increase their standard of living. An increased standard of living requires more energy. There is a direct relationship of standard of living to the utilization of energy in the economy. If all peoples of the world were to be brought to the standard of living of the United States, it would require more than a doubling of the energy supply. No source, other than fusion is capable of meeting this demand.

In summary, to meet the **world demand** for energy in the coming decades, the energy supply must not only replace the aging energy generating systems but it must also develop new "green", i.e. non-CO_2 emitting, sources. And to meet the goals of peoples around the world, the energy supply must nearly quadruple by the end of the century. This presents an **outstanding growth market** for fusion energy suppliers.

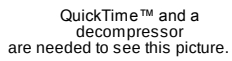
Competitive Edge

Fusion Power Corporation believes that fusion power is the energy of the future. By being the first fusion power company, FPC should have a **substantial advantage** over other attempts to capitalize on the generation of fusion power. Moreover, our exclusive license for the IP that controls the

ability of the heavy ion beams to reach and ignite the fuel pellet should provide a substantial advantage relative to subsequent start-ups that do not enjoy the use of this IP.

Fusion power is considered by most to be a power source of the future. Thus there are many projections of how the cost of future power sources might compare to current power generating systems. One such projection, made by Lawrence Berkeley, shows that projections of electric power cost for HIF systems that are less capable than the one designed by Fusion Power Corporation are **cost competitive** with coal. Our internal projections validate this cost estimate and suggest that even lower cost can be achieved due to the economy of scale of the larger system that we plan to build.

Having recently analyzed the cost of production of energy in the large-scale systems necessary for the practical usage of heavy ion fusion, Fusion Power Corporation is convinced that fusion energy will provide the **lowest average cost energy** relative to any other energy source. This is true despite the high cost of the accelerator. Our estimates show that cost will be 2.5 cents per kWh thermal or approximately 7 cents per electrical kwh but could easily be markedly less if direct conversion processes are employed.



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